



STEAM LOCOMOTIVE SERVICES, INC.

November 7, 2001

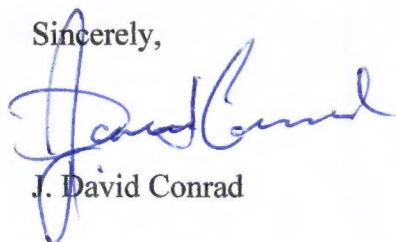
Mr. Robert Powell, Executive Director
Carbondale Historical Society
One North Main Street
Carbondale, PA 18407-2356

Dear Mr. Powell,

Enclosed please find my report (with photographs) covering my inspection of and recommendations regarding your former Delaware & Hudson Gravity Railroad combination freight and passenger car which I personally inspected on September 10 & 11, 2001 at the Homestead Golf Course in Carbondale, Pennsylvania.

Should you have any questions regarding the above or wish to discuss your project at any time in the future, please do not hesitate to contact me.

Sincerely,



J. David Conrad

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REPORT ON DELAWARE & HUDSON GRAVITY RAILROAD COMBINATION FREIGHT & PASSENGER CAR

This report, prepared November 9, 2001 covers my inspection of the former Delaware & Hudson Gravity Railroad combination freight and passenger car owned by the Carbondale Historical Society and Museum, Inc. whose offices are located at One North Main Street, Carbondale, Pennsylvania 18407. The inspection was conducted with the assistance of the organization's Executive Director, Mr. Robert Powell at the Homestead Golf Course where the car is stored on September 10 & 11, 2001. Photographs taken at this time are enclosed and identified in attachment - A.

HISTORY

This car was one several used on the Gravity Railroad, which was built c. 1829 and abandoned in 1899. Although the main purpose of the railroad was the transportation of coal, passenger service was provided for workers and their families as well as local residents. In addition, due to the unique nature of the railroad and the scenic area through which it ran, tourist trains were operated seasonally.

The railroad, as its name implies, used gravity as the motive power, at least on the downgrade portion of the line. Trains were hauled to the highest points of the line by cables attached to steam powered winches up steep inclines. For the downhill trip the speed of the cars were controlled by brakemen who operated handbrakes on each car. The speed was also controlled to some extent by the use of level track between the graded sections, none of which were as steep as the inclines.

It would appear that all of the railroad's rolling stock was built in the company shops. All cars were built mostly of wood with only the wheels and axels, couplings, handrails, fasteners and some substructure being steel. The design of the cars was somewhat out of the ordinary due to the unique nature of the line and the fact that the rolling stock operated only on that railroad (not interchanged with other lines partially due to the odd track gauge of 53"). The car building techniques used were typical of the period.

The car (number unknown) was probably built c. 1890 and operated until the railroad was abandoned in 1899 after which a number of the passenger cars were stripped of their metal components and sold to local residents. Only the car bodies were saved, end

platforms, wheels, axels, brakes, etc. were salvaged by the railroad. At that time it was moved to near its present location and used as a bunkhouse for farm workers. At some time in the 1950s' it was moved to its present site. Over the years it has not been modified save the addition of layers of roofing material. It is remarkable how much of the car remains intact, albeit in deteriorated condition.

INSPECTION SUMMARY

The car is sitting on uneven ground, unevenly supported. The car frame is bowed and humped in several directions and it is impossible to say whether or not it will straighten out when set somewhere level. Often times wood will not straighten out again once bowed. Most of the main frame appears to be in relatively good condition. A trench was dug at one point to inspect the center sills. Interior framing could not be thoroughly inspected due to the car siding being in place, but it can be expected that there will be some rotted sections. Much of the exterior wood is badly weathered and will never be smooth again. Some of the exterior wood, car framing (where visible) and roof boards are badly rotted. There is little paint left on the exterior of the car. Light sanding revealed that the car exterior was painted Tuscan red and then coated with varnish. The sash was treated likewise, although it had been orange at an earlier period. All exterior ventilation grills are missing. Wood on the car interior is mostly intact save several roof bow ends, which are rotted off. Most doors, sash and blinds are repairable. Several of the floorboards are rotten. Most of the paint inside the car is intact although in poor condition. All glass is broken or etched. Light sanding revealed that the interior was painted light gray, coated with varnish. There are no seats in the car. It is assumed that it once had seats, although no mounting holes, etc. could be found. The roof could not be thoroughly inspected due to several layers of roofing material being in place, however, from inside the car, the roof boards appear to be mostly intact although the outer roofing material is badly deteriorated.

RESTORATION vs. REPLICATION

At this point I would like to offer a few thoughts regarding the conservation and restoration of railroad equipment. Unlike fine art (and even furniture), it was expected that railroad equipment would be repaired and maintained over its service life. Therefore we can justify continuing such repairs and maintenance. That being said, I believe that we ought to retain as much of the original object as possible. In many cases it would be far easier to construct a replica than to restore a badly deteriorated car such as this one, but once done the question remains as to what to do with the original. In this case we have a car which has enough sound material remaining to justify restoration, bearing in mind that a good deal of new material will be used. Modern techniques such as the use of epoxy wood consolidators make it possible to retain much of the original wood while insuring that it will be structurally sound. It is true that the use of epoxy is not favored by some since its use is not reversible, but if its use enables us to retain a part that would otherwise be unusable, I think that we ought to do so. In any event there is a fine line to be drawn. Where does restoration stop and replication begin? At 51%? Who does the quantification? For our purposes here I'll call the proposed work restoration, even though one side of the car will be more of a replication.

DISPLAY AND INTERPRETATION

Ideally, the car would be housed in a suitable building after restoration, however it is my understanding that at this time there is insufficient inside space and that the car will be restored and periodically displayed. I would recommend that a purpose built trailer is obtained and that the car be mounted to said trailer until such time as it can be housed in a museum building. Mounting the car will provide it with a stable foundation, obviate the necessity of lifting it for further movement and provide for mobility to events where it can be displayed. It should be placed inside a suitable building for restoration and storage. Should the exterior of the car be restored as outlined below, signage should note that one side of the car is mostly original, and that the other side has been extensively restored to its appearance when in service c.1899. Since a similar car (No. 9 "Eclipse" at the Honesdale Historical Museum) with an intact interior exists, I would suggest that the interior of this car be used to exhibit maps and photographs explaining the Delaware & Hudson Gravity Railroad.

MOVEMENT AND TRANSPORTATION

The car is exceedingly fragile and must be moved with extreme care. I suggest that a purpose built trailer be designed to load the car onto to remove it from its present location, support it during restoration and display it on. The trailer should have an open frame (no floor) with members that correspond with the car's frame. The outer edges of the trailer frame must be higher than the center as per the car. The frame of the trailer ought to be somewhat longer than the car in case end platforms are constructed. The trailer should have at least four wheels, spaced so the trailer is always level (similar to a hay wagon) with brakes and a towbar that can be attached to a tractor or such. Once such a trailer has been constructed, the car should be carefully lifted with a crane onto same. Rigging the car will be critical. "I" beams must be placed under the car and attached to corresponding spreaders with matched cables to insure that the car is lifted evenly. Getting the "I" beams under the car will involve a lot of digging. Under no circumstances should the car be jacked up to get the beams in. The beams can be designed into the structure of the trailer or removed after the car has been thoroughly inspected and precautions taken not to damage it. Once loaded the car can be transported to an inside restoration site and later to where ever it is to be displayed.

MISSING PARTS AND COMPONENTS

Both "trucks" (wheels, axels, bearings, brakes, springs, etc.), end platforms complete with steps, handrails and buffers, couplers, brake mechanisms complete, outer ventilator covers, one interior ventilator cover (have 5 still in the car), north threshold plate (have south one on car) and baggage door guards.

The "trucks" would be very difficult and expensive to reproduce. A set exists under car No. 9, which could be used as a guide for manufacture. However the cost of making these would be possibly as much as \$50,000.00 therefore it is not recommended that these be made at this time. The end platforms, couplers, etc. and could be made, using the parts of car No.9 as a guide. Thus far, no outer ventilator cover has been found, and photographs do not show them clearly. It may be necessary to guess as to their appearance. The inner

ventilator cover could be reproduced using an original as a pattern. Baggage door guards can be constructed using existing evidence as a guide in their design.

MAJOR REPLACEMENTS AND REPAIRS

Roof: Remove outer layers to determine what material the original covering was. Remove outer boards to facilitate repairs to bows, etc. Renew rotted roof boards as needed. After repairs are made to sides, etc., repair roof, paint exterior of roof boards and recover with appropriate material.

Passenger end: Renew end beam, ends of center sills (shiplap to existing), roof plate @ left corner, tack moldings right and left, lower siding (might patch with siding removed from left side). The lower corner posts, door jams and left windowsill are rotted but might be repaired with an epoxy wood consolidator such as "ABATRON". Typically, these epoxies come in a liquid form, which is painted onto and soaks into the affected wood. Once this sets, an epoxy putty/filler is applied. This can be shaped to suit and later filed and sanded as needed. With some practice the repairs are nearly invisible once painted.

Left side: Replace all exterior wood including tack moldings, letter board cap strip, letter board, battens and boards, window sills, belt rail, siding and four sash. Note that once this wood has been carefully removed for use in making replacements it is likely that interior framing will be found to be in need of replacement or repair as well. Also note that some sections of siding removed may be useful for patching other areas.

Baggage end: Renew end beam, ends of center sills (shiplap to existing), facing board above left window and tack molding right and left.

Right side: Renew tack molding (all), about 12" of trim strip might be repaired with epoxy; renew battens and boards, belt rail and siding ahead of baggage door only.

Car frame: Badly bowed, may straighten out when leveled. Not thoroughly inspected since it is sitting on ground, but appears to be mostly sound. Inspect and repair as needed. Approximately 8-10 of the beams from the center sills to the side sills are missing or rotten and in need of renewal.

Interior: Renew left windowsills and stops, approximately 20% of the floor, an unknown amount of the sub floor. Renew ends of at least five roof bows and renew top plate and framing posts adjacent to where roof bows attach.

Doors, sash and blinds, etc: Remove, repair and refinish all (End doors: 2ea. baggage doors: 2ea. end sash: 4ea, sash: 4ea (4 to be renewed), blinds: 8ea. When these are reinstalled they should be adjusted for proper operation. Renew door jam guards at passenger end and baggage doors (rolled steel plate). Renew missing ventilator cover using existing one as a pattern taken to an iron or aluminum foundry for casting and a sheet metal shop for the other portions and assembly.

In general, wood should be replaced with the same species. Samples of wood can be analyzed for identification. Some species are extinct in large sizes but yet available as used lumber from old buildings, which have been torn down.

Once the repairs have been made, all wood (including interior painted surfaces) should be sanded, filled where necessary, primed and painted with oil based alkyd enamel. As noted previously, the exterior appears to have been Tuscan red with orange sash. It is possible that the original gray interior paint may be washed or sanded lightly to reclaim. Once painted (or cleaned) a coat of clear varnish should be applied. Metal components should be wire brushed, primed with a rust proof primer and painted an appropriate color (probably black) using alkyd enamel.

If it is decided to construct replica platforms, couplers, etc, these should be manufactured to fit the existing car rather than modifying the car to fit them. If no information can be found regarding the design of the exterior ventilator covers, I would suggest blanking them off as per the baggage end. In this way the car will appear "finished" and they can be removed without damaging anything if new information comes to light.

In all cases, photographic and written records should be made of the project and detailed notes made locating all reproduction components and repairs.

CHRONOLOGY

As with any project, a good plan is essential. The restoration of this car will be difficult due to the nature of wooden car construction techniques. Although the car was built from the ground up, it must be repaired starting at the top, dismantling it as we go down. Once any thing, which is going to be removed, has been, then it can be reconstructed starting at the bottom and working way back up again. Before the work on the roof can begin, some way must be found to tie or brace the sides since the roof itself is part of the structure and it would be bad practice (and possibly dangerous) to let them float free.

Leveling the car ought to be attempted once the car is loaded onto the trailer, but if it resists, then the process will be a gradual one, and it is possible that the car will never be level, in which case the restorer will have to make many compromises. In any event, the final leveling of the car must be done prior to the reconstruction of the sides and the reattachment of the roof.

Doors, sash, etc. ought not to be installed until the car is ready to paint. Some refitting will be needed.

In the event that it is decided to construct reproduction "trucks" etc., nothing that has been discussed above would prevent them from being installed.

As an additional resource, I would recommend articles on the subject of wooden passenger car construction and restoration by Glenn Guerra published in *Locomotive and Railway Preservation* magazine during the mid 1990s' (now out of print, but photocopies are available from the Railroad Museum of Pennsylvania at Strasburg, Pennsylvania).



J. David Conrad

LIST OF PHOTOGRAPHS

Number	Description
1-3	Exterior, left side
4-5	Exterior, right side
6	Baggage end
7-9	Baggage door and details, left side
10	Belt rail detail, right side
11-12	Window and sill details, left side
13-14	Outer vent cover and outer vent opening, left side
15-19	End hood details, both ends, both sides
20	Mounting bracket for unknown object, under passenger end hood
21	Passenger end detail
22	Passenger end door
23-24	Passenger end window details
25-28	Car frame details as seen from trench dug under car
29-31	Car interior views
32-34	Baggage end interior details
35-37	Car interior details of window and blinds
38	Interior ceiling
39-40	Interior baggage door and track details
41	Detail of interior roof bows with ends rotted and ventilator
42	Detail of ventilator
43	Detail of floor showing damaged section
44	Detail of floor showing where baggage door guards were mounted
45	Detail of interior where paint was sanded to reveal layers
46-47	Details of car No. 9 "trucks" and platform, coupling, and brakes

























































































WATCH YOUR STEP







